

What is claimed is:

1. A wave division multiplexed (WDM) optical communication system comprising:
  - a first optical fiber having a first end and a second end;
  - a plurality of line units optically coupled to the first optical fiber for amplification of a WDM optical signal propagating along the first optical fiber; and
  - a power cable for the line units;wherein at least one end of the power cable is terminated between the first end and the second end of the first optical fiber.
2. The WDM optical communication system of claim 1, further comprising:
  - a second power cable having a first end and a second end,
  - wherein a first end of the first power cable is located at a position proximate to the first end of the first optical fiber and a second end of the first power cable is terminated at a termination site between the first end of the first optical fiber and the second end of the first optical fiber, and
  - wherein the first end of the second power cable is terminated at the termination site and the second end of the second power cable is located at a position proximate to the second end of the first optical fiber.
3. The WDM optical communication system of claim 1, wherein the first power cable length is less than the total length of the first optical fiber.
4. The WDM optical communication system of claim 1, wherein the first power cable is terminated at about a midpoint of the first optical fiber.
5. The WDM optical communication system of claim 2, wherein the first end of the first power cable is connected to a positive voltage supply and the second end of the first power cable is connected to a negative voltage supply.
6. The WDM optical communication system of claim 2, wherein the first power cable is connected to a first voltage supply and the second power cable is connected to a second voltage supply.

7. The WDM optical communication system of claim 2, wherein the first and second power cables provide at least 10,000 watts of total power to the line units.
8. The WDM optical communication system of claim 1, wherein the first optical fiber is at least 9000 km in length.
9. The WDM optical communication system of claim 1, further comprising an optical tap for monitoring optical signal quality of the optical signal propagating along the first optical fiber, wherein the optical tap is located at a site of power termination.
10. The WDM optical communication system of claim 1, further comprising a gain correction filter for adjusting a gain profile of the optical signal propagating along the first optical fiber, wherein the gain correction filter is located at a site of power termination.
11. The WDM optical communication system of claim 1, further comprising:
  - an add/drop multiplexer,
  - wherein the add/drop multiplexer filters out at least one channel and fewer than all of the channels of the WDM optical signal propagating along the first optical fiber and inserts at least one other channel into the WDM optical signal propagating along the first optical fiber, and
  - wherein the add/drop multiplexer is located at a site of power termination.
12. The WDM optical communication system of claim 1, further comprising:
  - an optical termination positioned at a site of power termination; and
  - a second optical fiber positioned adjacent to the first optical fiber
  - wherein the optical termination terminates the second optical fiber, and
  - wherein the first optical fiber is not terminated by the optical termination.
13. The WDM optical communication system of claim 1, further comprising:
  - an optical splitter comprising:

an input optically coupled to the first optical fiber;  
a first output optically coupled to a first optical branch path; and  
a second output optically coupled to a second optical branch path,  
wherein the optical splitter provides an optical signal received on the input to  
the first optical branch path and to the second optical branch path, and  
wherein the optical splitter is located at a site of power termination.

14. The WDM optical communication system of claim 1, wherein the line units  
comprise Raman amplifiers.
15. The WDM optical communication system of claim 1, wherein said power cable is  
fed from only one end.
16. A wave division multiplexed (WDM) optical communication system comprising:  
an optical fiber having a first end and a second end, the optical fiber ends  
being terminated at the first end and the second end;  
a plurality of line units optically coupled to the optical fiber for amplification  
of a WDM optical signal propagating along the optical fiber; and  
a power cable having a first end and a second end, wherein the power cable  
is connected to the line units and provides power for the line units, and  
wherein at least one end of the power cable is terminated between said first  
end and said second end of the optical fiber.
17. The WDM optical communication system of claim 16, wherein the power cable  
length is less than the total length of the optical fiber.
18. The WDM optical communication system of claim 16, further comprising an optical  
tap for monitoring optical signal quality of the WDM optical signal propagating  
along the optical fiber, wherein the optical tap is located at an end point of the  
power cable.

19. The WDM optical communication system of claim 16, further comprising a gain correction filter for adjusting a gain profile of the WDM optical signal propagating along the first optical fiber, wherein the gain correction filter is located at an end point of the power cable.
20. The WDM optical communication system of claim 16, further comprising:
  - an optical add/drop multiplexer,
  - wherein the optical add/drop multiplexer filters out at least one channel of said WDM optical signal propagating along the optical fiber and inserts at least one other channel into WDM optical signal propagating along the optical fiber, and
  - wherein the optical add/drop multiplexer is located at an end point of the power cable.
21. The WDM optical communication system of claim 16, further comprising:
  - an optical splitter comprising:
    - an input optically coupled to the optical fiber;
    - a first output optically coupled to a first optical branch path; and
    - a second output optically coupled to a second optical branch path,
  - wherein the optical splitter provides an optical signal received on the input to the first optical branch path and to the second optical branch path, and
  - wherein the optical splitter is located at an end point of the power cable.
22. The WDM optical communication system of claim 16, wherein the line units comprise Raman amplifiers.
23. An amplification power supply for providing power to ultra long-haul optical line units for amplification of a WDM optical signal propagating along an optical fiber having a first end and a second end and terminated solely at the first end and the second end, comprising:
  - a power cable having a first end and a second end,
  - wherein the power cable is positioned adjacent to the optical fiber,

wherein the power cable is connected to the line units and provides power for the line units, and

wherein at least one end of the power cable is terminated at a power cable termination position between a first end and a second end of the optical fiber.

24. The amplification power supply of claim 23, wherein the power cable provides at least 10,000 watts of power to the line units.
25. The amplification power supply of claim 23, wherein the line units comprise Raman amplifiers.

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